RF Probe

041

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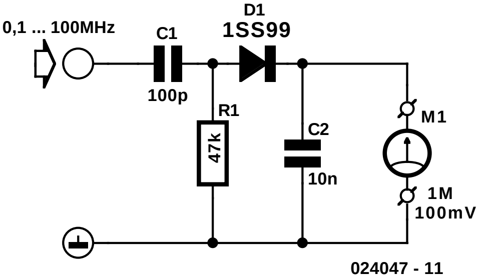
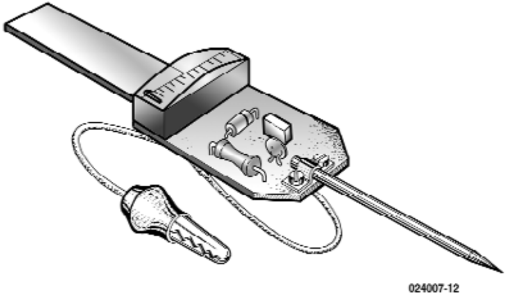
A RF probe is a handy piece of test equipment that converts a high frequency signal to a DC voltage. In this way it is very easy to measure RF voltages for either testing or adjustment purposes.

The RF probe described here is suitable for signals in the frequency range from about 100 kHz to 1000 MHz. Although the diode used here can, in principle, go up to 3 GHz, the impedance of the ground connection will adversely influence the measurement at such very high frequencies.





The probe delivers a DC output voltage that is equal to the peak value of the RF voltage minus the diode voltage drop, which amounts to about 100 mV. It is therefore necessary that the signals to be measured are greater than 100 mV. A multimeter is eminently suitable as the actual measuring instrument, provided it has a high enough input impedance (1 MΩ or more). When adjusting signals to their peak value, an analogue instrument is easier to use than a digital meter.

The enclosure for the prototype was a large aluminium felt-tip pen. After removing the felt tip itself, a metal pin was clamped in the (plastic) front of the pen; the four parts of the circuit can easily find a home inside the tube of the pen. A sharp point needs to be filed or ground on the end of the metal pin. A short, flexible piece of wire with a small alligator clip can be used as the ground connection. The aluminium housing can be grounded by placing a wire in the thread of the pen housing before screwing the tip back on. Drill a small hole in the bottom for the connections to the meter.

The accuracy of the RF probe is about 10%. The probe loads the circuit under measurement with about 47 kΩ and a very small capacitance.

A final hint to conclude: the suggested diode 1SS99 (a low barrier Schottky-type, up to 3 GHz) is available from, among others, Barend Hendriksen of Brummen, The Netherlands (www.xs4all.nl/~barendh/Indexned.htm).

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